

ART 34 AMENDMENT

## 1 CLAIMS

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3 1. Method for assessing the integrity of a structure  
4 (20), comprising the steps of:

5

- 6 i) collecting data relating to the initial  
7 dimensions of the structure (20),
- 8 ii) creating a computer model of the structure  
9 (20),
- 10 iii) collecting data relating to the estimated load  
11 on the structure (20),
- 12 iv) analysing the structure (20), using the  
13 computer model of the structure (20) and the  
14 load data, in order to define areas which are  
15 subject to relatively high stresses,
- 16 v) measuring, after a time interval, the  
17 dimensions of the structure (20) in high stress  
18 areas,
- 19 vi) updating the computer model of the structure  
20 (20), using the results of step v),
- 21 vii) re-analysing the structure (20), using the  
22 updated computer model and the load data, in  
23 order to calculate a value for the integrity of  
24 the structure.

25

26 2. Method according to Claim 1, wherein the method  
27 comprises the step of:

28 viii) repeating one or more times steps v), vi) and  
29 vii).

30

31 3. Method according to Claim 1 or 2, wherein the  
32 method comprises the step of:

- 1    ix) visualising the results of step vii).
- 2
- 3    4. Method according to Claim 1, 2 or 3, wherein the
- 4    method comprises the steps of:
- 5    x) measuring the actual load on the structure
- 6       (20),
- 7    xi) updating the data relating to the load on the
- 8       structure (20), and thereafter
- 9    xii) re-analysing the structure (20), using the
- 10      computer model and the updated load data, in
- 11      order to calculate a value for the integrity of
- 12      the structure (20).
- 13
- 14    5. Method according to Claim 4, wherein the method
- 15    comprises the step of:
- 16    xiii) repeating one or more times steps x), xi) and
- 17    xii).
- 18
- 19    6. Method according to Claims 4 or 5, wherein the
- 20    method comprises the step of:
- 21    xiv) visualising the results of step xii).
- 22
- 23    7. Method according to one of the preceding claims,
- 24    wherein the method comprises the step of installing,
- 25    after step iv), in high stress areas, a first set of
- 26    sensors (11) for measuring the dimensions of the
- 27    structure (20) in said high stress areas.
- 28
- 29    8. Method according to one of the preceding claims,
- 30    wherein the method comprises the step of installing,
- 31    after step iv), in high stress areas, a second set

1 of sensors (11) for measuring the load on the  
2 structure (20) in said high stress areas.

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4 9. Method according to Claim 7 or 8, wherein the  
5 method comprises the step of connecting the sensors  
6 (11) to a processing means (14), such as a computer,  
7 for transmitting data from the sensors (11) to the  
8 processing means (14) in real time.

9

10 10. Method according to one of the preceding claims,  
11 wherein the method comprises the step of prior to  
12 step iv), collecting data relating to known defects  
13 (23,24) of the structure (20) and thereafter using  
14 said defect-data, the computer model of the  
15 structure (20) and the load-data for defining areas  
16 which are subject to relatively high loads.

17

18 11. Method according to one of the preceding claims,  
19 wherein the method comprises the step of prior to  
20 step iv), estimating the minimum size of defects  
21 (23,24) in the structure (20) and thereafter using  
22 said estimated defect-data, the computer model of  
23 the structure (20) and the load-data for defining  
24 areas which are subject to relatively high loads.

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26 12. Method according to Claim 11, wherein the  
27 minimum size of the defects (23, 24) is estimated to  
28 be equal to the precision of the measurement  
29 equipment, used for measuring the dimensions of the  
30 structure (20).

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1    13. Method according to one of the preceding claims,  
2    wherein the method comprises the step of prior to  
3    step iv), collecting data relating to the load-  
4    history on the structure (20) and thereafter using,  
5    said load-history, the computer model of the  
6    structure (20) and the load-data for defining areas  
7    which are subject to relatively high loads.

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9    14. Processing arrangement (10) for assessing the  
10   integrity of a structure (20), provided with  
11   processing means (14), such as a computer, for using  
12   data relating to the dimensions of the structure  
13   (20) and the load on the structure (20) in a  
14   calculation of a value representing the integrity of  
15   the structure (20), wherein the processing  
16   arrangement (10) is provided with sensors (11) to  
17   measure data relating to the dimensions of the  
18   structure (20) and the load on the structure (20),  
19   the sensors (11) being adapted to transmit said data  
20   in real-time, wherein the processing means (14) are  
21   provided with receiving means for receiving said  
22   data and wherein the processing means (14) are  
23   adapted to analyse the data in order to update the  
24   calculation of the value representing the integrity  
25   of the structure (20).

26

27   15. Processing arrangement (10) according to Claim  
28   14, wherein the processing arrangement (10) is  
29   provided with representation means (15) for  
30   visualising the result of the calculation of the  
31   value representing the integrity of the structure.

32

1 16. Processing arrangement (10) according to Claim  
2 14 or 15, wherein the sensors (11) are adapted to  
3 measure pressure exerted on the structure.

4

5 17. Processing arrangement according to Claim 14 or  
6 15, wherein the sensors (11) are adapted to measure  
7 temperature.

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9 18. Processing arrangement (10) according to Claim  
10 14 or 15, wherein the sensors (11) are adapted to  
11 measure mechanical loading on the structure(20).

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13 19. Processing arrangement (10) according to Claim  
14 14 or 15, wherein the sensors (11) are adapted to  
15 measure fluid loading on the structure (20).

16

17 20. Processing arrangement (10) according to Claim  
18 14 or 15, wherein the sensors (11) are adapted to  
19 measure vibration.

20

21 21. Processing arrangement (10) according to Claim  
22 14 or 15, wherein the sensors (11) are adapted to  
23 measure acceleration experienced by the structure.

24

25 22. Structure (20), such as a plant, provided with a  
26 processing arrangement (10) according to Claims 14-  
27 21.

28

29 23. A computer program product comprising data and  
30 instructions that after being loaded by a processing  
31 arrangement (10) provides said arrangement (10) with

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1 the capacity to carry out a method according to  
2 Claims 1-13.

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4 24. A data carrier provided with a computer program  
5 product according to Claim 23.